

Heads Up: Real News About Drugs and Your Body

Brought to you by Scholastic and the scientists at the National Institute on Drug Abuse, National Institutes of Health, U.S. Department of Health and Human Services

STUDENT ARTICLES INSIDE

Drugs and the Teen Brain

PAGE 2



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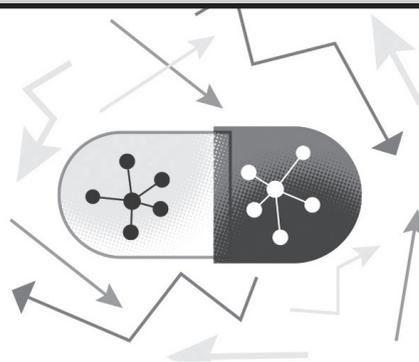
E-Cigarettes: A Dangerous Trend

PAGE 4



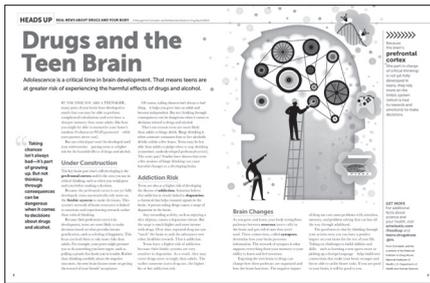
A Dangerous Mix

PAGE 6



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- For this Heads Up **Teacher Edition Compilation**, refer to **NIH Pub No. 19-DA-8070B**.
- For the accompanying Heads Up **Student Edition Compilation**, refer to **NIH Pub No. 18-DA-8070A**.



Drugs and the Teen Brain

As a teacher, you know that teens are at a critical time of development. The brain doesn't become fully developed until the mid-20s. This fact makes teens especially susceptible to the harmful effects of drugs and alcohol, putting them at a greater risk for addiction as well as damage to the brain. By sharing the article "Drugs and the Teen Brain" and teaching this lesson, you will help students learn how their brain develops and why using drugs and alcohol is especially risky.

Critical-Thinking Questions

1 Describe how your brain changes as you grow. How can these changes affect your behavior or abilities? *Answers may include that as you grow older, you develop and refine synapses (connections between neurons). These signal pathways allow you to learn, and they support your memory and emotions. Parts of the brain develop at different times. Specific regions of the brain are responsible for tasks such as movement, emotions, and critical thinking. As each region matures, it strengthens a person's abilities in the tasks related to that region.*

2 Explain the purpose of the prefrontal cortex and the limbic system in the brain. Give examples of types of behavior or activities that are controlled by each of these areas. *The prefrontal cortex is the area of the brain that is involved in critical thinking and decision-making. This area may be active when someone weighs the pros and cons of a decision, tries to solve a problem, or plans for the future. The limbic system is involved in emotions and rewards. This area is active when a certain activity makes you feel sad or happy, such as spending time with friends.*

3 Why are teens more at risk for becoming addicted to drugs than adults? Support your answer with text evidence. *Answers may include that people can become addicted to drugs because using them causes feelings of pleasure, which causes a release of dopamine in the brain. This chemical helps the brain remember the pleasurable experience. Over time, bursts of dopamine teach the brain to seek out drugs over any other rewarding experience. Teens are more at risk because the teen brain, which relies heavily on the reward center in the limbic system, is more sensitive to the effects of dopamine.*

Writing Prompts

Grades 6–8 Explain how the prefrontal cortex helps to reduce risk-taking.

Grades 9–10 The legal drinking age is 21. Do you agree with this policy? Cite text evidence to support your answer.

Grades 11–12 Parts of the teen brain are not yet fully developed. Explain why this can be harmful but also beneficial.

Paired Reading

"Addiction Is a Disease"
(<https://teens.drugabuse.gov/blog/post/addiction-disease>)

This article describes how drugs can cause brain changes that lead to addiction.

Writing Prompt Cite text evidence from the article "Addiction Is a Disease" to describe additional ways that drug addiction harms the brain. Also explain why addiction is considered a disease.

Activity Sheet Answers

Multiple choice 1. c; 2. b; 3. d; 4. False; 5. b; 6. True; 7. a; 8. True.

"Now Try This" 1. Answers may include that because the critical-thinking area of their brains is still developing, teens rely on the limbic system (involved in rewards and emotions) to make decisions. This may cause teens to make risky decisions that give immediate rewards. Teens' limbic systems are also more sensitive to dopamine, which may cause them to crave drugs more than adults. **2.** Answers may include that the teen brain is still in development, so exposure to drugs can negatively affect a teen's neural pathways. Positive experiences, like learning a skill, help the brain build new connections.

Subject Areas

- Science Literacy
- English Language Arts
- Health/Life Skills

Standards

CCSS

RST.6-8.1 / RST.9-10.1

- Cite specific textual evidence to support analysis of science and technical texts

W.6-8.1 / W.9-10.1

- Write arguments to support claims using valid reasoning and relevant and sufficient evidence

NGSS

MS-LS1.A / HS-LS1.A

- Structure and function

MS-LS1.D / HS-LS1.D

- Information processing

NGSS Practices

- Obtaining, evaluating, and communicating information/engaging in argument from evidence

NSES

- Personal Health
- Science and technology in society/science and technology in local, national, and global challenges

NCSS

- 8. Science, technology, and society

Additional Lesson Resources

- Vocabulary List: scholastic.com/heads-up/drugsandtheteen-brain
- heads-up.scholastic.com/teachers
- teens.drugabuse.gov



National Institute
on Drug Abuse

What Do You Know About the Teen Brain and Drugs?

Answer these questions to test your knowledge.



1. The brains of teenagers are:

- a. larger than those of adults
- b. the same as adult brains
- c. not yet fully developed
- d. made up of different parts than those of adults

2. The limbic system of the brain is involved mainly with:

- a. decision-making
- b. emotions
- c. problem-solving
- d. balance

3. The last part of the brain to fully develop is:

- a. the emotion center
- b. the part of the brain that controls automatic behavior like breathing
- c. the reward center
- d. the part of the brain involved in critical thinking

4. Teen brains are less sensitive to the effects of drugs than those of adults.

- True
- False

5. Which of the following statements is NOT true about the brain's prefrontal cortex?

- a. It helps people to weigh the risks of actions.
- b. It develops fully during childhood.
- c. It is used when adults need to make decisions.
- d. It can be damaged by drug use.

6. Drug use can cause changes to the brain.

- True
- False

7. Dopamine is:

- a. a natural chemical in the brain linked to pleasurable feelings
- b. a chemical found in drugs that affects the brain
- c. the region of the brain involved in emotions
- d. a natural chemical in the brain that decreases risk-taking

8. The number of connections between neurons in your brain can be affected by drug use.

- True
- False

NOW TRY THIS

Answer the following questions on a separate piece of paper after reading "Drugs and the Teen Brain."

1. What is the importance of the limbic system in the teen brain? Describe two ways this system can make teens more vulnerable to drugs.
2. Explain why a person's actions during their teen years can have a permanent impact on their life. Use evidence about brain development to support your answer.

For more information, visit scholastic.com/headsup

From Scholastic and the scientists of the National Institute on Drug Abuse, National Institutes of Health, U.S. Department of Health and Human Services

E-Cigarettes: A Dangerous Trend

Teens now use e-cigarettes more than any other nicotine-containing product. While e-cigarettes are less harmful than tobacco cigarettes for adult smokers, most versions pose a great risk to teens because they contain the same addictive nicotine found in cigarettes. One cartridge can contain as much nicotine as a pack of cigarettes. By sharing the article “E-Cigarettes: A Dangerous Trend” and teaching this lesson and activity, you’ll help students learn why e-cigarettes aren’t harmless.



Critical-Thinking Questions

1 How are e-cigarettes similar to tobacco cigarettes? How are they different? (*Both tobacco cigarettes and most e-cigarettes contain nicotine. E-cigarettes produce a vapor that contains nicotine and other chemicals, such as flavor compounds. Cigarettes release a toxic smoke that contains thousands of chemicals, roughly 70 of which are known to cause cancer. There is evidence that some e-cigarette vapor also contains cancer-causing chemicals.*)

2 What health risks do e-cigarettes pose? Cite scientific evidence from the text to support your answer. (*Most vaping devices contain nicotine, which is highly addictive. Using the drug can lead people to become addicted, which may cause them to use other nicotine-containing products, like tobacco cigarettes. Evidence shows that teens who vape are more likely to begin smoking. There is evidence that nicotine addiction may make teens more vulnerable to other drug addictions. There is some evidence that e-cigarette vapor also contains cancer-causing chemicals as well as toxic metals like cadmium, which can cause breathing problems.*)

3 Why is it important that scientists continue studying the health effects of e-cigarettes? (*The devices have existed for only about 15 years, so little is known about the long-term health effects of the devices. The history of smoking shows that it can take a long time to gather evidence about how dangerous using a drug or other substance is to your health.*)

Writing Prompts

Grades 6–8 Are e-cigarettes safer than traditional tobacco cigarettes? Cite evidence to support your answer.

Grades 9–10 Should e-cigarettes be illegal for teens? Cite evidence from the text to support your answer.

Grades 11–12 You read that scientists don’t know all of the risks associated with e-cigarettes. How do you think this uncertainty should affect how the devices are regulated?

Paired Reading

“Teen Researcher Asks: Why Do E-Cigs Harm the Lungs?” blog post, June 4, 2018, <https://teens.drugabuse.gov/blog>. This paired text describes a teen’s investigation into how e-cigarettes can damage the lungs.

Writing Prompt Vaping devices don’t release smoke like cigarettes do. Does that make them safe? Use text evidence from “E-Cigarettes: A Dangerous Trend” and “Teen Researcher Asks: Why Do E-Cigs Harm the Lungs?” to support your answer.

Activity Sheet Answers

1. Middle school: Roughly .5% to 3% or by 2.5%. High school: Roughly 2% to 12% or by 10%.

2. E-cigarette use is higher in high school. Answers will vary but may include that older students might have easier access and greater exposure to the devices.

3. You would expect the number of teen smokers to increase over time if e-cigarette use makes a person more likely to smoke cigarettes.

4. Answers will vary but should include reference to the top reasons students use e-cigarettes. Programs aimed to reduce marketing to teens may help. Other actions may include informing people that e-cigarettes have some of the same health risks as cigarettes.

Subject Areas

- Science Literacy
- English Language Arts
- Health/Life Skills

Standards

CCSS

RST.6-8.7 / RST.9-10.7

- Integrate and evaluate content presented in diverse formats, including visually and quantitatively, as well as in words

W.6-8.1 / W.9-10.1

- Write arguments to support claims using valid reasoning and relevant and sufficient evidence

NGSS Practices

- Analyzing and Interpreting Data/Engaging in Argument from Evidence/Obtaining, Evaluating, and Communicating Information

NSES

- Personal Health
- Science and technology in society/science and technology in local, national, and global challenges

NCSS

- 8. Science, technology, and society

Additional Lesson Resources

- Tiered Vocabulary Tools: Visit scholastic.com/headsup/ecigarettes for a vocabulary list to support this article.
- headsup.scholastic.com/teachers and teens.drugabuse.gov

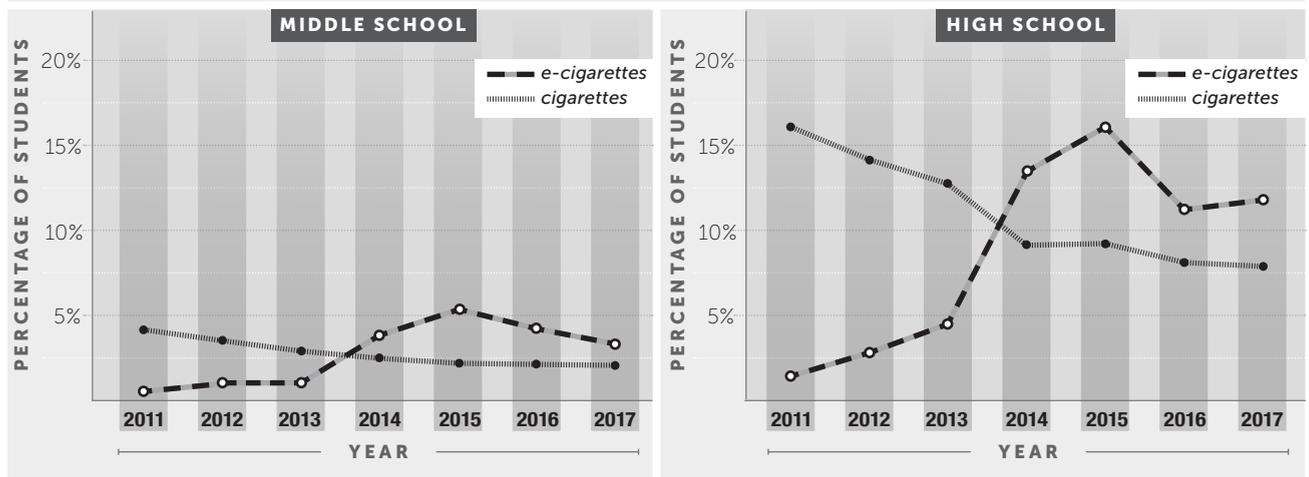


National Institute on Drug Abuse

Who Is Vaping?

Study the following data about e-cigarette use in teens. Then, along with the information in the article, answer the questions that follow.

PERCENTAGE OF STUDENTS WHO REPORTED USING CIGARETTES OR E-CIGARETTES



Top reasons for e-cigarette use among middle and high school students:

- 1 Friend or family member used them
- 2 They are available in flavors such as mint, candy, fruit, or chocolate
- 3 Belief that they are less harmful than other forms of tobacco, such as cigarettes
- 4 To try to quit using tobacco products, such as cigarettes
- 5 They can be used in areas where other tobacco products, such as cigarettes, are not allowed

Answer these questions on a separate sheet of paper as necessary.

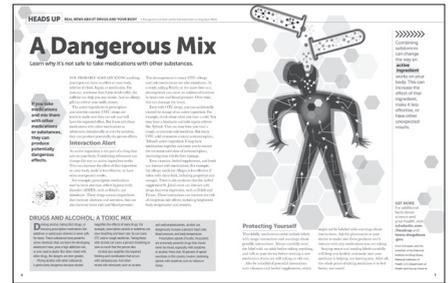
1. By roughly how much did the percentage of middle school students who use e-cigarettes increase between 2011 and 2017? How much did it increase for high school students in the same period?
2. In which population of students is e-cigarette use higher? Why do you think that is?
3. In the article, you read about data that suggests people who use e-cigarettes are more likely to start smoking. If that theory is correct, how would you expect the data in the graphs to change over time?
4. In the article, you read about some of the ways officials are trying to reduce teen vaping. Do you think these prevention efforts will be successful? Cite evidence to support your reasoning. What additional actions would you recommend?

For more information, visit scholastic.com/headsup From Scholastic and the scientists of the National Institute on Drug

Abuse, National Institutes of Health, U.S. Department of Health and Human Services

A Dangerous Mix

Many teens regularly take medications and over-the-counter drugs. But they may not know that mixing substances can cause unexpected and potentially dangerous effects. Those risks are even greater when alcohol and illicit drugs are involved. By sharing the student article “A Dangerous Mix,” teaching the lesson, and handing out the activity sheet, you will help students be smart about medicine safety.



Critical-Thinking Questions

1 What is an active ingredient? Where can they be found? Give an example of an active ingredient. (*An active ingredient, also known as an active chemical, is a substance that has an effect on the brain or body such as causing alertness or slowing breathing. Active chemicals can be found in drugs and alcohol, over-the-counter and prescriptions medications, and even natural substances like food, vitamins, and herbal supplements. Examples may include caffeine, decongestants, stimulants in ADHD medications, etc.*)

2 Explain why it is important to check the ingredients in any over-the-counter medications before taking them. (*Answers may include that many over-the-counter medications contain the same active ingredients. Mixing these medications together may cause you to ingest too large of a dose of a chemical, which may be harmful to your body. Mixing medications can also amplify their effects, which may cause dangerous bodily reactions.*)

3 Why might someone who mixes alcohol with an illicit drug end up in the emergency room? Use evidence to support your answer. (*Alcohol often magnifies the effects of a drug on the body. Depending on the drug, this can cause dangerous complications that may impair a person's breathing, such as with sedatives or opioids, or dangerously increase a person's heart rate, such as with stimulants like cocaine and methamphetamine.*)

Writing Prompts

Grades 6–8 Why is it important to tell your doctor about any vitamins or herbal supplements you are taking?

Grades 9–10 Describe at least two ways that the effect of a medication may change if it is mixed with another substance. Give examples of each.

Grades 11–12 Explain why mixing drugs such as opioids can increase risk of death.

Paired Reading

“Non-Addictive Drugs: Are They Always Safe?” (teens.drugabuse.gov/blog/post/non-addictive-drugs-are-they-always-safe) This paired text describes why even over-the-counter medications should be used with caution.

Writing Prompt Explain why it is important to follow the directions on an over-the-counter medication. Describe at least two possible risks if you misuse the drug. Have students use text evidence from “Non-Addictive Drugs: Are They Always Safe?” and “A Dangerous Mix” to support their answers.

Activity Sheet Answers

- The active ingredient in the medication is chlorpheniramine maleate.
- Assuming an age of 12 and up: You can take a maximum of 12 pills per 24 hours, which is equal to 24 milligrams of chlorpheniramine maleate.
- Answers may include that a person shouldn't drive a vehicle or operate heavy machinery when taking this medication. That's because the medication can cause the person to be drowsy.
- Alcohol, sedatives, and tranquilizers.
- Sedatives and tranquilizers are substances that slow breathing and heart rate and cause drowsiness. These are similar to the medication's side effects. When the substances are combined, the effects could be amplified or could result in other side effects. This is also true for alcohol, which can amplify the effects of medications.

Subject Areas

- Science Literacy
- English Language Arts
- Health/Life Skills

Standards

CCSS

RST.6-8.1 / RST.9-10.1

- Cite specific textual evidence to support analysis of science and technical texts

W.6-8.1 / W.9-10.1

- Write arguments to support claims, using valid reasoning and relevant and sufficient evidence

NGSS Practices

- Obtaining, evaluating, and communicating information/engaging in argument from evidence

NSES

- Personal health

NCSS

- 8. Science, technology, and society

Additional Lesson Resources

- Tiered Vocabulary Tools: Visit scholastic.com/headsup/adangerousmix for a vocabulary list to support this article.
- headsup.scholastic.com/teachers and teens.drugabuse.gov



National Institute
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Read the Label!

Directions: Read the label from an allergy and cold medication below and then answer the questions that follow.

Drug Facts

Active Ingredient (in each tablet)

Chlorpheniramine maleate 2 mg

Purpose

Antihistamine

Uses temporarily relieves symptoms due to hay fever or other upper respiratory allergies:

- sneezing
- runny nose
- itchy, watery eyes
- itchy throat

Warnings**Ask a doctor before use If you have**

- glaucoma
- a breathing problem such as emphysema or chronic bronchitis
- trouble urinating due to an enlarged prostate gland

Ask a doctor or pharmacist before use If you are taking tranquilizers or sedatives**When using this product**

- you may get drowsy
- avoid alcoholic drinks
- alcohol, sedatives, and tranquilizers may increase drowsiness
- be careful when driving a motor vehicle or operating machinery
- excitability may occur, especially in children

If pregnant or breast-feeding, ask a health professional before use.

Keep out of reach of children. In case of overdose, get medical help or contact a Poison Control Center right away.

Directions

adults and children 12 years and over	take 2 tablets every 4 to 6 hours; not more than 12 tablets in 24 hours
children 6 years to under 12 years	take 1 tablet every 4 to 6 hours; not more than 6 tablets in 24 hours
children under 6 years	ask a doctor

Other information store at 20-25° C (68-77° F) ■ protect from excessive moisture**Inactive ingredients** D&C yellow no. 10, lactose, magnesium stearate, microcrystalline cellulose, pregelatinized starch

Answer these questions on a separate sheet of paper as necessary.

1. What is the active ingredient in the medication?
2. What is the maximum dose in milligrams of the ingredient someone your age can take in 24 hours?
3. What are some activities that should be avoided while taking this medicine? Explain why.
4. Which substances should not be taken with the medication?
5. Research the effect of substances listed on the label that should not be used with this medication. Apply what you have learned in the student article to explain why these substances should not be combined. Include evidence from the label, the article, and any additional research to support your answer.

For more information, visit scholastic.com/headsup.

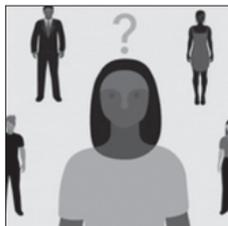
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Lessons, Texts & Printables



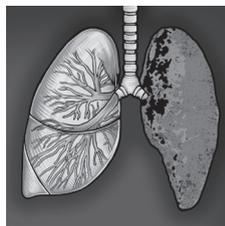
Science/ELA materials that teach important facts and elicit critical thinking

Videos



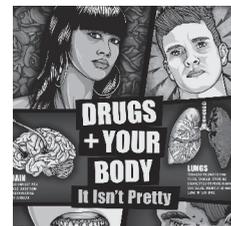
Classroom videos that illustrate the science of drug misuse

Interactives



Dynamic online supplements that engage students in core information

Poster/ Teaching Guides



Engaging visuals with activities for comprehension and reinforcement

COMPILATION 2018-19 Teacher Edition

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